

Missouri Department
of Natural Resources

Missouri Recreational Use Attainability Analyses:

Water Body Survey and Assessment Protocol

December 19, 2007

Note: Bolded terms are defined in the *Glossary*.

Division of Environmental Quality

Water Protection Program

Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol

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GLOSSARY

NOTE: This document occasionally refers to itself as “this document” or “this protocol.” The use of this phrase is meant to make reference to the entire document titled *Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol*.

Definitions of terms used in this document that are also found in the definitions in Section (§) 644.016 of the Revised Statutes of the State of Missouri (RSMo) and 10 Code of State Regulations (CSR) 20-2 are the same unless otherwise noted below.

7Q10: The lowest average flow for seven (7) consecutive days that has a probable recurrence interval of once-in-ten (10) years [10 CSR 20-7.031(1)(O)1.]

Base Flow Conditions: The portion of stream flow contributed by sources of water other than precipitation runoff. This refers to a fair weather flow sustained primarily by springs or groundwater seepage, wastewater discharges, irrigation return flows, releases from reservoirs, or some combination of these sources.

Beneficial Use: All **existing** and **designated uses** on or in **waters of the State** as defined in the **Water Quality Standards (WQS)** at 10 CSR 20-7.031(1)(C).

Clean Water Act: The federal Water Pollution Control Act, 33 U.S.C. §1251 et seq.

Clean Water Commission: The water contaminant control agency formed in Missouri under §644.021 RSMo.

Department: Missouri Department of Natural Resources.

Designated Use: Those uses specified in water quality standards for each water body or segment whether or not they are being attained [40 CFR 131.3(f)]. A **beneficial use** designated to a **water of the state** as shown in Tables G and H of the **Water Quality Standards (WQS)**.

Ephemeral Stream: A stream that flows only in direct response to precipitation in the immediate watershed or in response to the melting of a cover of snow and ice, and which has a channel bottom that is always above the local water table.

Existing Use: Those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the **water quality standards** [40 CFR 131.3(e)].

Intermittent Stream: A stream or reach of a stream that is below the local water table for at least some part of the year, and obtains its flow from both surface runoff and ground water discharge.

Low Flow Conditions: The point in time in which the **beneficial uses** within a water body are most susceptible to the effects of pollution, which is generally but not necessarily when a stream is at or below its **7Q10** flow. A lake's critical condition shall be determined on a case-by-case basis, but would normally be when the surface water is at or below its ordinary or base level.

Median: The value in an ordered set of values below and above which there is an equal number of values or which is the arithmetic mean of the two middle values if there is no one middle value.

Use Attainability Analysis: A structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological, and economic factors as described in §131.10(g) [40 CFR 131.3(g)]. Also known as a “UAA.”

Waters of the State: Waters defined in §644.016(26) RSMo as: “[A]ll rivers, streams, lakes and other bodies of surface and subsurface water lying within or forming a part of the boundaries of the state which are not entirely confined and located completely upon lands owned, leased or otherwise controlled by a single person or by two or more persons jointly or as tenants in common and includes waters of the United States lying within the state.” The term “water,” or “waters,” may be used in this document in place of “**waters of the State.**”

Water Quality Standards (WQS): The provisions of 10 CSR 20-7.031 covering water classification, **beneficial uses**, general and specific water quality criteria, antidegradation and all other requirements establishing limits on the amount of pollution permissible in **waters of the State.**

MISSOURI RECREATIONAL USE ATTAINABILITY ANALYSES: WATER BODY SURVEY AND ASSESSMENT PROTOCOL

I. Purpose

This protocol is intended as guidance for any party interested in conducting investigations to provide scientifically defensible information on existing and attainable recreational uses of the classified **waters of the State**. Classified waters are an important subset of **waters of the State** as they are afforded specific protections by regulation and are subject to numeric criteria to protect **designated uses**. Information and data obtained using the guidance presented in this document will be used to:

- Comply with federal requirements for the designation of recreational uses,
- Assist in identifying **waters of the State** which support recreational uses,
- Assist in identifying **waters of the State** which do not support recreational uses,
- Respond to changes in the capacity of surface waters to support recreational uses, and/or
- Review and modify, as appropriate, the recreational use designation of surface waters.

Any interested party may conduct a **Use Attainability Analysis (UAA)** and submit the resulting report to the Missouri Department of Natural Resources (**department**). Any party wishing to conduct a UAA is strongly encouraged to attend the **department's** UAA Training and/or thoroughly review training and instructional materials on the department's Web site. In addition, the **department** strongly encourages any party wishing to perform a UAA to arrange a Pre-Assessment meeting with **department** staff prior to initiating work. The UAA Training and Pre-Assessment meetings ensure a confident understanding and efficient and accurate implementation of this protocol.

II. Summary of Applicable Laws and Regulations

The following is a summary of federal and state laws and regulations applicable to **beneficial use** designation. This summary is not intended to be a comprehensive listing of all applicable federal and state laws and regulations. Rather, it is included to provide the federal and state regulatory basis for clean water law implementation of **beneficial use** designation and use attainability analyses.

A. Recreational Uses and the Federal Water Pollution Control Act

Sections 101(a) and 303(c) of the Federal Water Pollution Control Act (**Clean Water Act**) establish a "rebuttable presumption" that "fishable/swimmable" uses are attainable and should apply to a water body unless it is affirmatively demonstrated that such uses are not attainable.

Clean Water Act Section 101(a)(2):

It is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish and wildlife and provides for recreation in and on the water be achieved by July 1, 1983.

Clean Water Act Section 303(c)(2)(A):

Whenever the State revises or adopts a new standard, such revised or new standards shall be submitted to the Administrator. Such revised or new water quality standard shall consist of the designated uses of the navigable waters involved and the water quality criteria for such waters based upon such uses. Such standards shall be such as to protect the public health or welfare, enhance the quality of water and serve the purposes of this Act. Such standards shall be established taking into consideration their use and value for public water supplies, propagation of fish and wildlife, recreational purposes, and agricultural, industrial, and other purposes, and also taking into consideration their use and value for navigation.

Federal regulations extend the “fishable/swimmable” goal to Waters of the United States, the definition of which can be found at Title 40 Code of Federal Regulations (CFR) Section (§) 122.2:

Waters of the United States or waters of the U.S. means:

- (a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;*
- (b) All interstate waters, including interstate “wetlands;”*
- (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, “wetlands,” sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:*
 - (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes;*
 - (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or*
 - (3) Which are used or could be used for industrial purposes by industries in interstate commerce;*
- (d) All impoundments of waters otherwise defined as waters of the United States under this definition;*
- (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;*
- (f) The territorial sea; and*
- (g) “Wetlands” adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.*

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States. [See Note 1 of this section.] Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

Federal regulation also contains details regarding the State's role in designating uses for water bodies, including suggestions for categories of use classifications, which were derived from Section 303(c)(2)(A) of the Act. This regulation can be found at 40 CFR 131.10(a):

Each State must specify appropriate water uses to be achieved and protected. The classification of the waters of the State must take into consideration the use and value of water for public water supplies, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial, and other purposes including navigation. In no case shall a State adopt waste transport or waste assimilation as a designated use for any waters of the United States.

In determining and ensuring protection of uses, federal regulation makes a distinction between two broad use categories that apply to all use classifications. **Existing uses** are those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the **Water Quality Standards**. **Designated uses** are those uses specified in **Water Quality Standards** for each water body or segment whether or not they are being attained. In short, **existing uses** focus on the past or present condition of the water body while **designated uses** focus on an attainable condition within the water body.

Provisions within federal regulation at 40 CFR 131.10(h) preclude the removal of existing or attainable uses:

States may not remove designated uses if:

- (1) They are existing uses, as defined in §131.3, unless a use requiring more stringent criteria is added; or*
- (2) Such uses will be attained by implementing effluent limits required under sections 301(b) and 306 of the Act and by implementing cost-effective and reasonable best management practices for nonpoint source control.*

In addition, provisions within federal regulation at 40 CFR 131.10(i) require that States upgrade the **designated uses** of a water body to what is actually being attained:

Where existing water quality standards specify designated uses less than those which are presently being attained, the State shall revise its standards to reflect the uses actually being attained.

Federal regulation requires the State to conduct a **Use Attainability Analysis** in order to justify deviation from the use designations set forth in the "fishable/swimmable" goal of the **Clean Water Act**. This provision can be found at 40 CFR 131.10(j):

A State must conduct a use attainability analysis as described in §131.3(g) whenever:

- (1) The State designates or has designated uses that do not include the uses specified in section 101(a)(2) of the Act, or*
- (2) The State wishes to remove a designated use that is specified in section 101(a)(2) of the Act or to adopt subcategories of uses specified in 101(a)(2) of the Act which require less stringent criteria.*

The federal definition of **Use Attainability Analysis** (UAA), as referenced at 40 CFR 131.10(j), can be found at 40 CFR 131.3(g):

Use attainability analysis is a structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological, and economic factors as described in §131.10(g).

States may remove a **designated use**, that is not an **existing use**, if it can be demonstrated that attaining the **designated use** is infeasible. Federal regulation at 40 CFR 131.10(g) identifies the factors that must be considered in making such a demonstration:

States may remove a designated use which is not an existing use, as defined in §131.3, or establish sub-categories of a use if the State can demonstrate that attaining the designated use is not feasible because:

- (1) Naturally occurring pollutant concentrations prevent the attainment of the use; or*
- (2) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met; or*
- (3) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or*
- (4) Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or.*
- (5) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses¹; or*
- (6) Controls more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact.*

B. Recreational Uses and the Missouri Clean Water Law

The Missouri Clean Water Law (Section 644, Missouri Revised Statutes (RSMo)) and the **Water Quality Standards** (10 CSR 20-7.031) establish water quality goals for all **waters of the State**. **Waters of the State** are defined in the Missouri Clean Water Law and Title 10 Code of State Regulations (CSR) Division 20 as:

All rivers, streams, lakes and other bodies of surface and subsurface water lying within or forming a part of the boundaries of the state which are not entirely confined and located completely upon lands owned, leased or otherwise controlled by a single person or by two (2) or more persons jointly or as tenants in common. These waters also include waters of the United States lying within or adjacent the state. [10 CSR 20-2.010(82)]

¹ Physical features, as described in 40 CFR 131.10(g)5., must be associated with one or more of the other factors [40 CFR 131.10(g)1.-4. and 6.] in order to remove a recreational **designated use**.

As required by federal regulation [40 CFR 131.10(a)], the State fulfills its responsibility for designating uses through water body classification and use designation. All **waters of the State** have an assigned classification that identifies the hydrologic nature of the water body and the default characteristics and **beneficial uses** that may apply. The water body classification system used in Missouri is as follows:

Class L1 – Lakes used primarily for public drinking water supply [10 CSR 20-7.031(1)(F)1.]

Class L2 – Major reservoirs [10 CSR 20-7.031(1)(F)2.]

Class L3 – Other lakes which are **waters of the State**. These include both public and private lakes. For effluent regulation purposes, publicly owned L3 lakes are those for which a substantial portion of the surrounding lands are publicly owned or managed [10 CSR 20-7.031(1)(F)3.]

Class P – Streams that maintain permanent flow even in drought periods [10 CSR 20-7.031(1)(F)4.]

Class P1 – Standing-water reaches of Class P streams [10 CSR 20-7.031(1)(F)5.]

Class C – Streams that may cease flow in dry periods but maintain permanent pools which support aquatic life [10 CSR 20-7.031(1)(F)6.]

Class W – Wetlands that are **waters of the State** that meet the criteria in the *Corps of Engineers Wetlands Delineation Manual* (January 1987), and subsequent federal revisions. Class W waters do not include wetlands that are artificially created on dry land and maintained for the treatment of mine drainage, stormwater control, drainage associated with road construction, or industrial, municipal or agricultural waste. Class W determination on any specific site shall be consistent with federal law [10 CSR 20-7.031(1)(F)7.]

Unclassified – **Waters of the State** that have not yet been classified.

Beneficial or designated uses of classified waters can be found at 10 CSR 20-7.031(1)(C) and are identified in Tables G and H of 10 CSR 20-7.031. As of November 30, 2005 all waters in Tables G and H of 10 CSR 20-7.031 are presumed to support whole body contact recreation unless a **Use Attainability Analysis** (UAA) has shown that the use is unattainable. The use designation for whole body contact recreation may be removed or modified through a UAA for only those waters where whole body contact is not an **existing use**. [10 CSR 20-7.031(1)(C)8.]

III. Missouri Recreational Uses and Use Attainability Analysis Factors and Criteria

The Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol (Protocol) has been developed to provide scientifically defensible information that will enable the **department** to make accurate determinations of existing and attainable recreational uses. The recreational **designated uses** addressed by this protocol are whole body contact recreation and secondary contact recreation. Definitions

for these recreational **designated uses** and the criteria used to make a determination of existing and attainable uses can be found in the sections that follow.

A. Missouri Recreational Uses

Definitions for the recreational **designated uses** in Missouri can be found in the **Water Quality Standards** regulation:

10 CSR 20-7.031(1)(C)8. Whole body contact recreation – Activities in which there is direct human contact with the raw surface water to the point of complete body submergence. The raw water may be ingested accidentally and certain sensitive body organs, such as the eyes, ears and the nose, will be exposed to the water. Although the water may be ingested accidentally, it is not intended to be used as a potable supply unless acceptable treatment is applied. Water so designated is intended to be used for swimming, water skiing or skin diving. All waters in Tables G and H of this rule are presumed to support whole body contact recreation unless a Use Attainability Analysis (UAA) has shown that the use is unattainable. The use designation for whole body contact recreation may be removed or modified through a UAA for only those waters where whole body contact is not an existing use. Assignment of this use does not grant an individual the right to trespass when a land is not open to and accessible by the public through law or written permission of the landowner.

A. Category A. This category applies to those water segments that have been established by the property owner as public swimming areas allowing full and free access by the public for swimming purposes and waters with existing whole body contact recreational use(s). Examples of this category include, but are not limited to, public swimming beaches and property where whole body contact recreational activity is open to and accessible by the public through law or written permission of the landowner.

B. Category B. This category applies to waters designated for whole body contact recreation not contained within category A.

10 CSR 20-7.031(1)(C)9. Secondary contact recreation – Uses include fishing, wading, commercial and recreational boating, any limited contact incidental to shoreline activities, and activities in which users do not swim or float in the water. These recreational activities may result in contact with the water that is either incidental or accidental and the probability of ingesting appreciable quantities of water is minimal. Assignment of this use does not grant an individual the right to trespass when a land is not open to and accessible by the public through law or written permission of the landowner.

Water body segments that have a designated recreational use may have that use removed if it can be shown that the use cannot be attained due to one or more of the factors described at 40 CFR 131.10(g)(1) – (6). The State must provide evidence in the form of a **Use Attainability Analysis** and demonstrate that the use is neither existing nor attainable. Any water body with an **existing use** that occurred after November 28,

1975, but is no longer observed at the time of the UAA, must remain designated for that use unless another use is substituted that has water quality criteria as stringent or more stringent than the original use.

B. Missouri Recreational Use Attainability Analysis Factors and Criteria

The following italicized paragraphs present the six factors found in federal regulation [40 CFR 131.10(g)] that may be used to justify removal of a **designated use**. The text that follows the italicized paragraphs provides additional guidance for implementing the federal regulation for Missouri's waters. It is the **department's** intent to develop specific Recreational Use Attainability Analysis protocols for each of the six factors. However, only the factor at 40 CFR 131.10(g)(2) pertaining to "Natural, **ephemeral, intermittent or low flow conditions**" is currently complete and being implemented.

1. Natural Pollutant Sources – 40 CFR 131.10(g)(1):

States may remove a designated use which is not an existing use, as defined in §131.3, or establish sub-categories of a use if the State can demonstrate that attaining the designated use is not feasible because:

Naturally occurring pollutant concentrations prevent the attainment of the use.

The primary pollutant of concern for recreational use is pathogens. Where natural sources of bacteria, such as wildlife, are the cause of noncompliance with the **Water Quality Standards** and cannot be controlled, then it could be concluded through the UAA process that water-contact recreation is not attainable. Documentation could include, but is not limited to, watershed characterization, bacterial source tracking, antibiotic resistance analysis, historical accounts, and/or interviews. When watersheds contain both natural and anthropogenic sources of bacteria, the UAA must separately quantify the bacterial contributions from natural sources and show through science that the natural contribution alone is the cause for water quality exceeding the bacterial standard.

2. Natural, **Ephemeral, Intermittent or Low Flow Conditions** – 40 CFR 131.10(g)(2):

States may remove a designated use which is not an existing use, as defined in §131.3, or establish sub-categories of a use if the State can demonstrate that attaining the designated use is not feasible because:

Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met.

The **Use Attainability Analysis** must show that naturally caused **ephemeral, intermittent or low flow conditions** prevent the attainment of recreational uses. Stream surveys should be conducted during the recreational season (April 1 to

October 31) unless sufficient evidence can be provided outside this season. In order to support whole body contact recreation, a maximum depth of at least one meter or a **median** depth of at least one-half meter must be maintained during **base flow conditions** in the survey area.

Secondary contact recreation uses will be considered attainable when the water has a depth of at least one-half meter during **base flow conditions** or when clear evidence of an **existing use** is shown.

3. Non-Remedial, Human Caused Conditions – 40 CFR 131.10(g)(3):

States may remove a designated use which is not an existing use, as defined in §131.3, or establish sub-categories of a use if the State can demonstrate that attaining the designated use is not feasible because:

Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place.

A designation of recreational use can be removed if documentation through an environmental assessment of multiple alternatives demonstrates that one or more of the following apply:

- Human caused conditions cannot be remedied;
- Correction of the human caused conditions would cause more environmental damage than what currently exists;
- Human caused sources of pollution cannot be remedied; or
- Correction of the human caused sources of pollution would cause more environmental damage than what currently exists.

4. Hydrologic Modifications – 40 CFR 131.10(g)(4):

States may remove a designated use which is not an existing use, as defined in §131.3, or establish sub-categories of a use if the State can demonstrate that attaining the designated use is not feasible because:

Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use.

The removal of recreational **designated uses** may be considered when permanent or long-term hydrologic modifications to the water body segment prohibit the attainment of the use. The **Use Attainability Analysis** must show that the hydrologic modifications are constructed and operated in such a way that recreation does not or reasonably cannot occur within the water body segment.

5. Natural Physical Features – 40 CFR 131.10(g)(5):

States may remove a designated use which is not an existing use, as defined in §131.3, or establish sub-categories of a use if the State can demonstrate that attaining the designated use is not feasible because:

Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses.

This factor alone may not be used to justify the removal of recreational **designated uses**. Physical features, as described in 40 CFR 131.10(g)5., must be associated with one or more of the other factors [40 CFR 131.10(g)1.-4. and 6.] in order to remove a designated recreational use.

6. Substantial and Widespread Economic and Social Impact – 40 CFR 131.10(g)(6)

States may remove a designated use which is not an existing use, as defined in §131.3, or establish sub-categories of a use if the State can demonstrate that attaining the designated use is not feasible because:

Controls more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact.

This factor may be applicable when the construction of pollution control measures required to meet the bacteria standards for recreational uses would result in substantial and widespread economic and social impacts. Potential sources for evaluating substantial and widespread economic and social impacts, which provide criteria for decision making, include:

- EPA's *Interim Economic Guidance for Water Quality Standards Workbook* (EPA 823-B-95-002, <http://www.epa.gov/waterscience/standards/econworkbook/>) or
- EPA's *Combined Sewer Overflows—Guidance for Financial Capability Assessment and Schedule Development* (EPA 832-B-97-004, <http://www.epa.gov/npdes/pubs/csofc.pdf>).

C. Applicable Recreational Use Attainability Analysis Factor and Criteria

For the purpose of conducting Recreational **Use Attainability Analyses** within the State of Missouri, this Water Body Survey and Assessment Protocol has been developed to consider natural, **ephemeral**, **intermittent** or **low flow conditions**, as per 40 CFR 131.10(g)(2), that prevent the attainment of recreational uses.

IV. Missouri Recreational Use Attainability Analysis (UAA) Survey Procedures

The following section presents the processes and procedures by which Recreational **Use Attainability Analyses** are initiated, conducted, and completed in the State of Missouri. The processes and procedures in this section have been drafted to ensure defensibility and confidence in the **Use Attainability Analysis (UAA)** process and provide a structured and scientific framework for **designated use** determinations. Adherence to these policies and procedures will ensure **Use Attainability Analyses** that are complete and acceptable to the **department**.

A. UAA Training

The **department** will offer and conduct training to present its expectations for and the required elements of complete and acceptable **Use Attainability Analyses**. The training will be offered on an as needed basis to those wishing to conduct a UAA. Any party wishing to conduct a UAA is strongly encouraged to attend **department** training and/or thoroughly review training and instructional materials available on the **department's** Web site. A link to the **department's Use Attainability Analysis** Web site can be found below:

<http://www.dnr.mo.gov/env/wpp/wqstandards/uaa/index.html>

B. UAA Pre-Assessment Meeting

Any party wishing to conduct a **Use Attainability Analysis** is strongly encouraged to meet with **department** staff and present a detailed Pre-Assessment Plan (See Section IV.C. of this document) for approval before beginning data collection. Interested parties are strongly encouraged to present the detailed Pre-Assessment Plan (plan) to the **department** at least 30 days before the scheduled survey date. Once the plan is approved and the survey is completed, any significant deviation from the approved plan should be noted in the UAA report (See IV.E, the "UAA Report Submission" section of this document).

The Pre-Assessment Plan should include a statement of the issue and include a description of the water body as listed in 10 CSR 20-7.031, Table H. A detailed description and maps of the segment to be evaluated, survey sites, adjacent landowners, surrounding land use, hydrologic characteristics and other relevant information should be a part of the plan presented to the **department** at the Pre-Assessment Meeting. The **department** will issue a UAA reference number to every approved plan.

Any party wishing to conduct a **Use Attainability Analysis** is strongly encouraged to take full advantage of the UAA Training and Pre-Assessment Meeting to ensure a complete and acceptable UAA report is submitted to the **department**.

C. UAA Pre-Assessment Plans

To aid in the preparation of comprehensive UAA Pre-Assessment Plans, the following guidelines are provided. Sources for the information listed below can be found at the

end of this section. Questions on these guidelines or the UAA Pre-Assessment Plan should be directed to the **department's Use Attainability Analysis** coordinator.

- Locate and identify the following on a 1:24,000 scale topographic map:
 - The upstream and downstream limits of the classified reach as described in rule at 10 CSR 20-7.031, Table H;
 - Any wastewater treatment facilities that discharge into the segment of concern;
 - Road crossings;
 - Public lands and parks located near the water body; and
 - Areas of population.
- Obtain county plat maps. For areas where the water body is largely on private property, this information will help locate major property owners along the water body both to gain access and conduct interviews.
- Locate any involved wastewater treatment facilities to ensure they are active and the correct water body is being surveyed. It is important to know the location of involved wastewater treatment facilities and their location with respect to the water body being surveyed.
- Locate areas in which the water body is accessible to the public and areas having the highest potential for recreational use.
- Locate residents living near the water body. They will be the most familiar with the water body and are the most likely to use the water body. Since these residents are the most knowledgeable about the water body, they are very good candidates to interview regarding water body use.

In addition to the *Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol*, the following materials and information are available from the **department's** Water Protection Program:

- _____ 10 CSR 20-7.031 Missouri **Water Quality Standards**
- _____ State Operating (NPDES)-permitted facilities located on the water body
- _____ Water Body Identification Number (WBID #)
- _____ Eight-digit Hydrologic Unit Code (HUC)
- _____ Stream survey data (if available)
- _____ Maps of the watershed
- _____ Water quality data

The following materials may be available from the United States Geological Survey (USGS):

- _____ Daily stream flow records
- _____ Water quality monitoring records
- _____ 1:24,000 (7.5 minute) topographic quadrangle map

The following sources may also have stream survey records:

- _____ Missouri Department of Natural Resources Regional Offices
- _____ Missouri Department of Natural Resources' Water Resources Center
- _____ Missouri Department of Conservation
- _____ United States Fish & Wildlife Service
- _____ United States Army Corps of Engineers
- _____ Missouri Stream Teams
- _____ Local municipalities
- _____ Local universities
- _____ Library literature searches

D. UAA Field Survey Procedures

The following sections detail the field survey procedures that must be followed in order to satisfy the data and information requirements needed to assess recreational uses per 40 CFR 131.10(g)(2). Questions regarding these procedures should be directed to the **department's Use Attainability Analysis** coordinator.

1. Recreational Season

Use Attainability Analyses directed at assessing recreational uses must be performed during the recreational season. The recreational season in Missouri is from April 1 to October 31 as defined in rule at 10 CSR 20-7.031(4)(C). However, **Use Attainability Analyses** may be performed at any time of the year if sufficient evidence exists to confidently determine an existing and/or attainable recreational use.

2. Base Flow Conditions

Use Attainability Analyses are only "snapshots" of observations when conducted in accordance with this protocol. To acquire the best results from a single field survey, UAAs should be conducted during **base flow conditions**. Base flow is that portion of stream flow contributed by sources of water other than precipitation runoff. This refers to a fair weather flow sustained primarily by springs or groundwater seepage, wastewater discharges, irrigation return flows, releases from reservoirs, or some combination of these sources.

3. Weather Conditions

It is important to know and record the local weather conditions that occur before and during a UAA field survey. Precipitation events can have a significant effect on in-stream conditions and have the potential to elevate the stream above base flow. Surveyors are therefore required to submit rainfall data for the 10 days prior to initiating fieldwork. There are a number of excellent sources for rainfall data on the Web.

Those conducting UAAs should also include questions about the weather in any interviews that are conducted. Precipitation events can often be very localized and asking questions such as “What’s your weather been like lately?” and “Any measurable rain?” can yield useful information on localized events. Record the answers to these questions under the “Additional Comments” section of *Data Sheet D – Recreational Use Interview*.

Official Missouri drought conditions prevailing at the time of data collection must also be recorded. This information is recorded by checking the appropriate box on *Data Sheet B – Site Characterization* and can be obtained from the **department’s** Web site.

4. Water Body Survey Sites

To be representative, the targeted water body shall contain a minimum of three survey sites. All survey sites should be evenly spaced along the water body segment. In general, there should be three sites per every five miles of stream. If fewer than three sites are available or if there are large gaps along a long stream segment, the reason(s) for the gaps must be documented. Any survey gaps within a stream segment should be filled in with interviews, by gaining access through owner permission, and/or through some other method of assessing the stream (e.g., topographic maps, aerial photos). Sites must be numbered in an upstream to downstream order.

The most representative survey sites must be identified in the Pre-Assessment Plan. In addition, those sites that are possible or likely locations for recreational uses must also be identified. If information is given regarding locations of other potential recreation sites within less accessible stretches of the UAA segment², then those sites shall also be included in the survey if possible. Also, permitted discharges should be considered during site selection. Sites near hydrologically temporal anomalies, like root wads and beaver or debris dams, must be avoided.

For lake surveys, one site may be sufficient to characterize existing or potential uses if the entire lake can be adequately observed from one location. In addition, other methods of assessing the lake (e.g., topographic maps, aerial photos) may be used to assess the presence of an **existing use** (e.g., boat docks, swim areas).

When evaluating water bodies on private property, surveyors must secure the landowner’s permission to access the sites.

² UAA segment is the stream segment targeted for a UAA and is not required to be the entire water body segment as described in Table H of 10 CSR 20-7.031. If less than the full length of a water body segment is surveyed, the start and end points of the shorter segment must be clearly identified on the survey forms. Partial assessments of lakes are not allowed.

5. Measuring Depth

All information and data gathered when measuring depth at a survey site must be recorded on *Data Sheet C – Field Survey Results*. The length, width, and depth of any isolated features that are surveyed must be recorded on *Data Sheet B - Site Characterization*. Depth is to be measured in meters.

The following steps are to be followed when measuring depth at each survey site:

- a. Determine the average width of the stream from the observation point. The observation point is the location at which the water body is accessed to conduct the survey.
- b. The length of the survey segment will be 20 times the average width of the stream determined in Step 1. The length of the survey segment shall be a minimum of 150 meters to a maximum of 300 meters.
- c. The entire survey segment shall be walked and 11 equidistant cross-sections shall be measured along the length of the segment. Cross-sections must not be placed near hydrologically temporal anomalies like root wads and beaver or debris dams. Cross-section spacing and location must be documented on *Data Sheet C*.
- d. The spacing of depth measurements along a cross-section must ensure there are at least ten measurements between the left and right banks. All depth data collected along individual cross-sections must be recorded on *Data Sheet C*. Cross-sections must be numbered in an upstream to downstream order.
- e. Depth must be measured in meters. Measurements that are less than the minimum level of measurement should be recorded as less than (<) on the data sheet. For database and arithmetic purposes, less than values shall be one-half of the detection limit (e.g., “< 0.1 m” would be entered as “0.05 m” for calculation purposes).
- f. When collecting cross-section data along the stream segment, there may be features that fall between cross-section surveys that are at least one meter deep. The location, maximum depth, length, and width of these features must be recorded and provided on *Data Sheet B*. Features determined to be hydrologically temporal anomalies (e.g., root wads and beaver or debris dams) should not be recorded.

If a site to be surveyed is physically inaccessible for obtaining measurements, the following methods may be used to gather data:

- Another site may be chosen. If another site is chosen in lieu of one that has been included in the Pre-Assessment Plan, documentation of the new site location and rationale for the change must be provided.

- A “fishing pole” method may be used. Transect depth measurements can be obtained by lowering a weighted, marked (in meters) fishing line or rope into the stream from a bridge or other such structure until the site is adequately assessed for depth.
- Interviews of adjacent landowners or interested persons may be used to establish an **existing use**. All interviews must be documented using *Data Sheet D – Recreational Use Interview*.

6. Water Body Segments in Populated Areas

Recreational uses of waters are more likely to occur in areas where higher population densities exist. This is especially true in residential areas. A recreational **Use Attainability Analysis** for a water body in an area of higher population density is the same process as a recreational **Use Attainability Analysis** for a rural water body. However, the search for evidence on existing and/or attainable recreational uses in populated areas must be thorough and may need to involve an expanded effort including, but not limited to, multiple field surveys, several interviews with area residents, and an extensive collection of water quality data.

7. Sub-segmentation

A water body may be a candidate for sub-segmentation if it can be demonstrated that the recreational use is not existing or attainable for a portion of the water body segment. Sub-segmentation should be addressed during the Pre-Assessment Meeting and in the statement of the issue section of the UAA report (See Section IV.E. of this document). If it becomes evident that sub-segmentation may be appropriate after fieldwork begins, the Pre-Assessment Plan should be revisited and modified, if necessary, to meet the distribution of sites requirement found in the “Water Body Survey Sites” section of this document. Sub-segmentation of lakes is not allowed.

If sub-segmentation of the water body is desired, the party conducting the survey must clearly identify the start and end points (upstream and downstream coordinates, respectively) of the sub-segment and specifically discuss justification in the UAA report. The endpoints of the sub-segment shall be at a stream confluence as illustrated in the 1:24,000 National Hydrography Dataset (NHD) created by the United States Geological Survey.

8. UAA Field Survey Documentation

The accurate completion and submission of **Use Attainability Analysis** field survey documentation is extremely important. Data and information in the form of maps, data collection sheets, photographs, and interviews will assist the **department** in making a determination of existing and/or attainable recreational uses. The following sections detail the requirements for completing and submitting these documents.

a. Maps

All sites must be clearly marked on 1:24,000 (7.5 minute) USGS topographic quadrangle maps. The Universal Transverse Mercator (UTM), North American Datum 1983 (NAD83), Zone 15 (or 16 in south-east Missouri) coordinate (X,Y) system shall be used and recorded for each site with all appropriate fields completed on *Data Sheets B and C*. Site locational coordinates may be collected using a Global Positioning System (GPS) receiver or interpolated from a *Missouri Atlas & Gazetteer*. While GPS coordinates are the preferred method of establishing site locations, mapping-related Web sites like that available at the **department's** Division of Geology and Land Survey, Publication Desk may be used. Examples of other Web sites with geographic information available include the Center for Agricultural, Resource, and Environmental Systems (CARES) Web site and *TopoZone*. GPS-ready software is also available (e.g., Map Tech's *Terrain Navigator*) and may be used.

Submitted maps should include, at a minimum, the following information. For those items marked with an "*", staff from the Water Protection Program's Water Quality Monitoring and Assessment Section can be contacted if assistance is required.

- Water body name (only "classified segments" as per 10 CSR 20-7.031, Table H)*
- Water body identification number (WBID)*
- Upstream and downstream ends of the classified segment evaluated by the UAA*
- UAA number (assigned by the **department** during Pre-Assessment Meeting)*
- All survey sites and their corresponding numbers
- Locations referenced in interviews (clearly identify interviewee and activity)
- Point sources (i.e., permitted facilities)*
- Cities, towns
- County names and applicable county lines
- Major roads
- Minor roads, with enough detail to physically drive to survey sites (reference county maps, *Missouri Atlas & Gazetteer*, USGS 7.5-minute topographic quadrangle maps, etc.)
- Public areas (e.g., national, state and local parks; conservation or wildlife areas; national or state forests)
- Local landmarks (e.g., churches, cemeteries, Boy and Girl Scout Camps, sale barns, vineyards, airfields)
- North Arrow
- Scale

Both electronic and hard copies of the map must be submitted to the **department**, the latter for posting on the **department** Web site during required public comment periods. If necessary, the hard copy of the map may be scanned prior to submittal to create the required electronic copy. If the surveyor finds that one map containing all the above-listed elements is “too busy” to read, more than one map may be submitted *as long as the same base map (same size) is used, and the maps are numbered consecutively* (e.g., 1 of 2, 2 of 2, etc.).

b. Data Sheets

Field Data Sheets A through D shall be used to collect field survey data when conducting **Use Attainability Analyses**. All field data sheets must be legible and completed in their entirety, including dates and surveyor name and signature blocks. The field data sheets for conducting recreational UAAs can be found in Appendix 3 of this document and are as follows:

- *Data Sheet A – Water Body Identification.*
Data Sheet A must be completed for each water body segment. Each UAA submittal must have one Data Sheet A.
- *Data Sheet B – Site Characterization.*
Data Sheet B must be completed for each site that is surveyed. Each UAA submittal must have at least three Data Sheet B.
- *Data Sheet C – Field Survey Results.*
Data Sheet C must be completed for each site that is surveyed. Each UAA submittal must have one Data Sheet C for each site.
- *Data Sheet D – Recreational Use Interview.*
Data Sheet D must be completed for each interview that is performed when conducting a UAA. The interview form must be filled out in its entirety and contact information for the interviewee recorded.

c. Photographic Record

A photographic record must be made of each site during the site survey. Photographs should include both an upstream view and downstream view and must clearly depict the entire channel feature (e.g., pool, riffle, run) measured. Photographs should show any human use or evidence of human use (e.g., anglers fishing, fishing tackle, fire pits, human footprints or paths, ATV tracks). They should also include any evidence of potential uses (e.g., playgrounds nearby). Photographs may also show a lack of use, such as dry creek beds, “no trespass” signs, purple paint, fencing, and isolated areas. All photographs need an obvious scale and must be catalogued in a manner that indicates the WBID, site location, date, view orientation and what is being shown. Photographs must be in a digital format for electronic submission.

d. Interviews

Interviews from users present during the field survey, streamside landowners and local residents are encouraged in order to obtain information on existing and historical uses of the water body in question. Interviews are especially important in cases where depth measurements are peripheral.

Interviews are to be clearly recorded using *Data Sheet D – Recreational Use Interview*. The specific instructions and questions provided on *Data Sheet D* must be followed or the interview may not be acceptable. If unsupervised children or teenagers present along the stream during the survey are interviewed, do not record their names or other contact information.

In cases where telephone interviews are conducted, the interviewee should have in their possession an adequate map during the interview (See IV.D.8.a, the “Maps” section of this document). If they do not have a map, it may be prudent to restrict the focus of the interview to activities occurring on the stream only within the interviewee’s property boundaries, and perhaps just upstream and downstream from the interviewee’s property.

E. UAA Report Submission

Any interested party may conduct a Recreational **Use Attainability Analysis** and submit the report to the **department** for review. Two copies of the completed UAA report and all supporting documentation should be sent to:

UAA Internal Review Committee
Water Quality Monitoring & Assessment Section
Water Protection Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102-0176

In order to ensure a complete UAA is submitted to the **department**, the instructions and guidance provided in this document must be followed and the UAA report must contain the following:

- Statement of the issue
- Presentation and evaluation of all evidence (including data)
- All data sheets (A-D) using **department** format, completed (See IV.D.8.b, the “Data Sheets” section of this document)
- All photographs, labeled and showing perspective/location/scale (See IV.D.8.c, the “Photographic Record” section of this document)
- All interviews that were conducted (See IV.D.8.d, the “Interviews” section of this document)

- Maps of the water body segment, survey sites with GPS coordinates, and other relevant details (See IV.D.8.a, the “Maps” section of this document), and
- Copy of the UAA Pre-Assessment Plan (See IV.C. of this document). If field conditions required deviation from the approved plan, a justification for the deviation must be included. The justification shall explain how deviation from the approved plan does not affect the representativeness of the survey sites used.

A diagram of the **Use Attainability Analysis** evaluation process that must be considered when drafting the UAA report can be found in Appendix 1 of this document. The **department** will return incomplete UAAs or request that missing elements be submitted before proceeding with the UAA review.

V. Missouri Recreational Use Attainability Analysis Review Process

The following section details the Missouri Recreational Use Attainability Analysis review process. Information on the **department**’s Internal Review Committee and opportunities for public participation are provided.

A. Internal Review Committee

An Internal Review Committee (“Committee”) will meet periodically, or as needed, to review submitted **Use Attainability Analyses** for completeness and adequacy. The Internal Review Committee will consist of at least three employees within the Water Quality Monitoring and Assessment Section of the Water Protection Program. The **department** or other partnering agencies may perform QA/QC procedures and follow-up surveys on any submitted UAA to ensure the completeness, adequacy and accuracy of submitted material. All incomplete UAAs will be returned to the submitter for revisions.

The Committee will review complete UAAs and make a recommendation on recreational uses to the director of the Water Protection Program. The Committee will use a “weight of evidence” approach and make its recommendation using the information and data provided in the UAA submittal. Having weighed the information and data provided in the UAA submittal, the recommendation of the committee will be based on the following considerations:

- The whole body contact recreation **designated use** will be considered attainable if the maximum or the **median** depth criterion is met.
- The whole body contact recreation **designated use** will be considered existing when the photographic record, interviews, or other evidence of use provide sufficient reliable evidence that whole body contact recreation has occurred on the water body on or after November 28, 1975.
- The whole body contact recreation **designated use** will be judged inconclusive when borderline depth measurements do not provide reasonable assurance that removal of the whole body contact recreation **designated use** is appropriate. In

these cases, additional investigation and documentation of the potential for use or attainability is required. Interviews, photographs, geology, topography, drought conditions at the time of survey, and other information are important considerations when measured depths are close to the applicable depth criteria.

The findings of the Committee will be recorded on *Data Sheet E – Results of Internal Review Committee* which can be found in Appendix 3 of this document. For each completed and reviewed **Use Attainability Analysis**, the committee recommendation on recreational uses will be one of the following:

- Add Use – The **Use Attainability Analysis** demonstrates either an existing or attainable recreational use where the use is not currently designated in Table H of 10 CSR 20-7.031. The water body segment will be assigned the recreational **designated use** in Table H of 10 CSR 20-7.031.
- Retain Use – The **Use Attainability Analysis** demonstrates either an existing or attainable recreational use and the use is currently designated in Table H of 10 CSR 20-7.031. The water body segment will retain the recreational **designated use** in Table H of 10 CSR 20-7.031.
- Remove Use – The **Use Attainability Analysis** demonstrates neither an existing nor attainable recreational use and the use is currently designated in Table H of 10 CSR 20-7.031. The recreational **designated use** will be removed from the water body segment in Table H of 10 CSR 20-7.031.
- Modify Use – The **Use Attainability Analysis** demonstrates that different recreational use designations are necessary for different sections of the water body segment. Recreational use designations will be added, retained, or removed in Table H of 10 CSR 20-7.031 depending on the existence or attainability of the recreational use.
- Inconclusive – The **Use Attainability Analysis** does not definitively demonstrate that new or revised recreational use designations are required. The water body segment will retain the current recreational use designations found in Table H of 10 CSR 20-7.031.

Should the Internal Review Committee recommend to “Modify” recreational uses for a portion of a classified water body, the committee recommendation will include the upstream and downstream ends of the modified use segment. The upstream and downstream locations of the modified segment will occur at confluences of the water body and follow the USGS 1:24,000 National Hydrography Dataset (NHD) system.

After the director of the Water Protection Program accepts the recommendations of the Internal Review Committee, the Committee recommendations will be posted on the department’s **Use Attainability Analysis** Web site. If the UAA supports a confident decision to “Add” or “Retain” recreational uses, the recommendation will be forwarded to the Missouri **Clean Water Commission** (Commission) for approval. If the UAA

supports a decision to “Remove” or “Modify” a recreational use, the UAA submittal and Internal Review Committee recommendation will be made available to the public for comment.

B. Public Participation

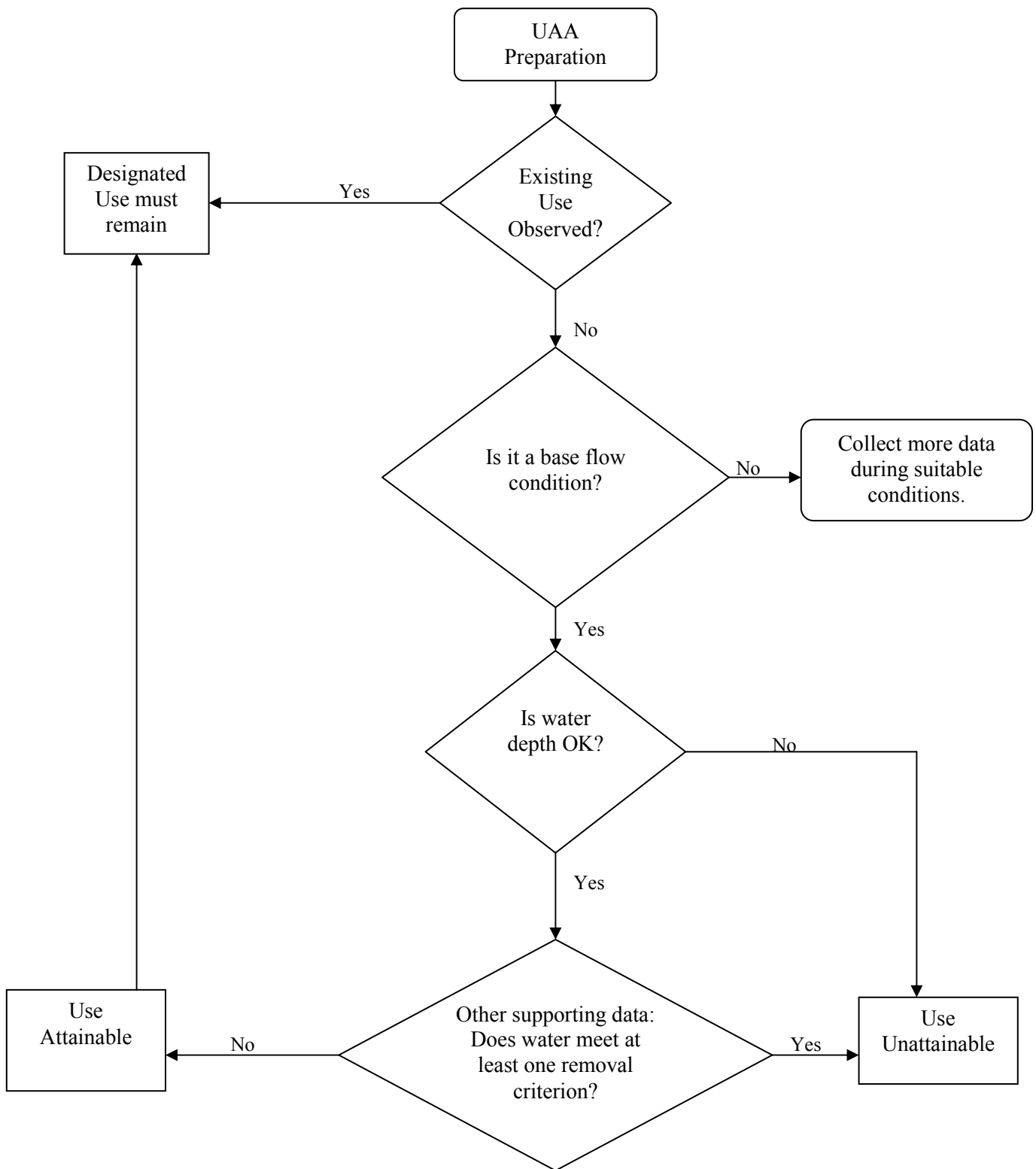
All work products associated with **Use Attainability Analysis** activities are open to the public. The **department** maintains records of each UAA conducted and will make this information available upon request. Completed UAAs will be posted on the **department’s** Web site. The removal or modification of designated recreational uses must include an opportunity for public participation. A brief description (notice) of the **designated use** change for a particular water body will be circulated within the geographic area of the water body segment by posting the notice in post offices and public places. Where available, notification will also be provided via a **department** news release to media outlets in the geographic area. The notice will also be mailed by the **department** to persons who have notified the **department** of their interest or who have requested the findings of the UAA. Public review and comment on the UAA findings and the proposed removal or modification of recreational **designated uses** will be sought during the rulemaking process.

C. Regulatory Process

All recreational **designated use** changes (Add, Remove, or Modify) will be incorporated into Missouri’s **Water Quality Standards** (10 CSR 20-7.031). All recreational **designated use** changes approved by the Missouri **Clean Water Commission** will be made available for public comment during the **Water Quality Standards** rulemaking process. Participation by the United States Environmental Protection Agency during the **Water Quality Standards** rulemaking process will provide federal oversight of the recreational use designation process as required in federal regulation. A flow chart of the **Use Attainability Analysis** Regulatory Process can be found in Appendix 2 of this document.

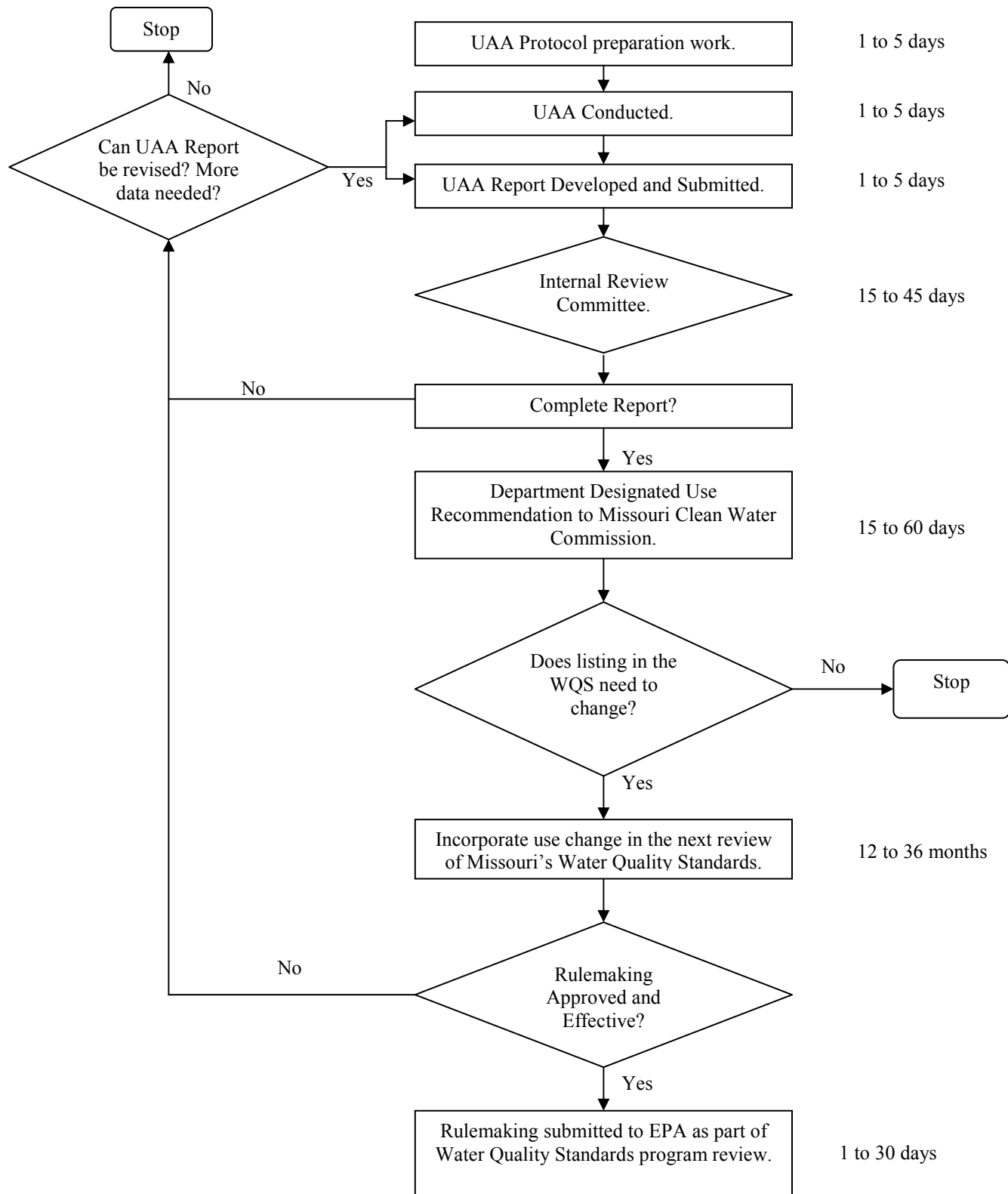
Appendix 1

Use Attainability Analysis Evaluation Process



Appendix 2

Use Attainability Analysis Regulatory Process



Appendix 3

Missouri Recreational Use Attainability Analysis Data Sheets

- Data Sheet A – Water Body Identification (1 page)
- Data Sheet B – Site Characterization (3 pages)
- Data Sheet C – Field Survey Results (1 page)
- Data Sheet D – Recreational Use Interview (4 pages)
- Data Sheet E – Results of Internal Review Committee (1-2 pages)

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet A – Water Body Identification

I. Water Body Information (for water body being surveyed)

Water Body Name (from USGS 7.5' quad):
Missouri Water Body Identification (WBID) Number:
8-digit HUC:
County(ies), Listed Upstream to Downstream:
Upstream Legal Description (from Table H):
Downstream Legal Description (from Table H):
Number of sites evaluated:
List all site numbers, <u>consecutively upstream to downstream</u> :
Include a Site Location Map(s). The map must include all requirements detailed in the <i>Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol</i> (Section IV.D.8.a).

II. Facility Information (list all permitted discharges to this water body segment)

Facility Name(s) and Permit Number(s):
--

III. UAA Surveyor (please **PRINT** legibly)

Name of Surveyor:	Telephone Number:
Organization/Employer:	

Please verify that you have completed all sections of all data sheets, checked all applicable boxes, provided a map (that includes all requirements listed in the *Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol*) and that this form is complete.

Signed: _____ **Date:** _____

WBID # _____

Site # _____

Field Data Sheets for Recreational Use Stream Surveys**Data Sheet B – Site Characterization** (Page 1 of 3)

(must be completed for each site)

Date & Time:	Location Description (e.g., road crossing):
Stream Name:	
Current Weather Conditions:	Facility Name(s):
Weather Conditions for Past 10 days:	Permit Number(s):
Official Drought Conditions at time of this survey (search DNR home page for “drought”): No drought <input type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X):	Northing (UTM Y):	Horizontal Accuracy: (EPE / FOM / PDOP) Meters
Site 11	Easting (UTM X):	Northing (UTM Y):	Horizontal Accuracy: (EPE / FOM / PDOP) Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at the time of survey.)

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input type="checkbox"/> None of the above	<input type="checkbox"/> Other:
Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				

Stream Name & WBID # _____

Date of Survey _____

Site # _____

Field Data Sheets for Recreational Use Stream Surveys**Data Sheet B – Site Characterization** (Page 2 of 3)**Surrounding Conditions*:** (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:
Comments:				

Evidence of Human Use*: (Attach photos and reference in "Photos" section.)

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot paths/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Rope swings
<input type="checkbox"/> RV / ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock Watering
<input type="checkbox"/> None of the above	Comments / Other:			

Substrate*: (These values should add up to 100%.)

% Cobble	% Gravel	% Sand	% Silt	% Mud/Clay	% Bedrock
----------	----------	--------	--------	------------	-----------

Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

--

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input type="checkbox"/> Solids	<input type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input type="checkbox"/> None	<input type="checkbox"/> Other:

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Date of Survey _____

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

Please verify that you have completed all sections, checked all applicable boxes, and that the form is complete.

Printed Names of Personnel Collecting Data: _____

Surveyor's Signature: _____ Date of Survey: _____

Organization: _____ Position: _____

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: _____ Waterbody ID: _____ Site #: _____ Estimated Channel Incision: _____ (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: _____ UTM Y: _____ +/- _____ (meters) 11 UTM X: _____ UTM Y: _____ +/- _____ (meters) Average Stream Width: _____ (meters) Length of Survey Segment: _____ (meters) (To determine Length of Reach) (20x average stream width) Field Staff: _____	Dissolved Oxygen Date: _____ Time: _____ Dissolved Oxygen: _____ (mg/L) Dissolved Oxygen: _____ (% sat) Specific Cond: _____ (µS/cm) Water Temperature: _____ (°C)
--	--

Station	Transect Cross-Section																					
	01		02		03		04		05		06		07		08		09		10		11	
	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1																						
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
Right Bank																						
Feature Type (riffle, run, or pool)																						

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
 Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)
 Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

Surveyor's Signature: _____ Date: _____

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet D – Recreational Use Interview

(must be completed for each interview)

I. Introduction

Stream Name and WBID: _____

Date & Time (include AM or PM): _____

Interviewed: ☐ In person ☐ By phone ☐ By mail

(NOTE: If you are an Interviewee filling out this form to mail back to DNR, proceed to Question #1.)

Interviewee selected because (e.g., house next to stream; standing by stream, etc.) _____

Interviewer introduction to Interviewee: “My name is _____, I work for __ (name of your employer) _____, and I am collecting information on how people use __ (name of the stream) _____.”

ASK:

1.) Are you willing to respond to a survey about this stream? (It will just take a few minutes.)

☐ Yes ☐ No If yes, list contact information for the interviewee below:

Legal name: _____

Current mailing address: _____

Daytime phone number: (_____) _____

E-mail address (optional): _____

2.a.) Do you live in this area? ☐ Yes ☐ No

If yes, how many years? _____

2.b.) If you don't live in this area, are you still familiar with this stream? ☐ Yes ☐ No

If yes, how many years? _____

If no, thank the individual for taking the time to talk to you and conclude the interview.

3.) Are you familiar with this particular stretch of the stream? (show them the map, pointing out local landmarks such as roads, bridges, property lines) ☐ Yes ☐ No

If yes, proceed to “II. Personal Use?”.

If no, proceed to Section V.

II. Personal Use?

1.) Have you or your family personally used the stream for recreation since November 28, 1975? ☐ Yes ☐ No

If yes, proceed to #3.

If no, proceed to, and complete #2.

2.a.) If no, list reasons stream not used. _____

b.) From here proceed to “III. Witnessed Use?”.

3.) How do you use the stream?

Whole Body Contact Recreation (WBCR)

<input type="checkbox"/> Swimming	<input type="checkbox"/> Tubing	<input type="checkbox"/> Snorkeling/Skin Diving	<input type="checkbox"/> Water Skiing
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If Interviewee (or family) used the stream for WBCR since Nov. 28, 1975, ask:

4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? _____

4.b.) Where, exactly? Describe specific location *and mark on the map* (See map requirements in the protocol). _____

Secondary Contact Recreation (SCR)

<input type="checkbox"/> Fishing	<input type="checkbox"/> Wading	<input type="checkbox"/> Boating	<input type="checkbox"/> Trapping	<input type="checkbox"/> Other:
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If Interviewee (or family) used the stream for SCR since Nov. 28, 1975, ask:

4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? _____

4.d.) Where, exactly? Describe specific location *and mark on the map* (See map requirements in the protocol). _____

4.e.) Which of these times and places (if any) did children wade or play? _____

III. Witnessed Use?

1.) Have you observed others using this stream for recreation since Nov. 28, 1975?

☐ Yes ☐ NoIf yes, proceed to #2.If no, proceed to, "IV. Anecdotal Use?".

2.) What kinds of uses have you witnessed?

Whole Body Contact Recreation (WBCR)

<input type="checkbox"/> Swimming	<input type="checkbox"/> Tubing	<input type="checkbox"/> Snorkeling/Skin Diving	<input type="checkbox"/> Water Skiing
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If Interviewee witnessed WBCR use since Nov. 28, 1975, ask the following questions:

2.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? _____

WBID # _____

Name of Person Interviewed _____

Site # _____

Date of Interview _____

2.b.) Where, exactly? Describe specific location *and mark on the map* (See map requirements in the protocol). _____

<i>Secondary Contact Recreation (SCR)</i>
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<input type="checkbox"/> Fishing	<input type="checkbox"/> Wading	<input type="checkbox"/> Boating	<input type="checkbox"/> Trapping	<input type="checkbox"/> Other:
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If Interviewee witnessed SCR use since Nov. 28, 1975, ask the following questions:

2.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? _____

2.d.) Where, exactly? Describe specific location *and mark on the map* (See map requirements in the protocol). _____

2.e.) Which of these times and places (if any) did you specifically witness children wading or playing? _____

IV. Anecdotal Use?

1.) Have you heard about anyone using this stream since Nov. 28, 1975 for recreation – not seen or done yourself, but just heard about it? ☐ Yes ☐ No

If yes, proceed to #2.

If no, thank the individual for taking the time to talk to you and conclude the interview.

2.) What kind of uses have you heard about?

<i>Whole Body Contact Recreation (WBCR)</i>
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<input type="checkbox"/> Swimming	<input type="checkbox"/> Tubing	<input type="checkbox"/> Snorkeling/Skin Diving	<input type="checkbox"/> Water Skiing
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If Interviewee heard of WBCR use since Nov. 28, 1975, ask the following questions:

2.a.) When did these uses take place (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? _____

2.b.) Where, exactly? Describe specific location *and mark on the map* (See map requirements in the protocol). _____

WBID # _____

Name of Person Interviewed _____

Site # _____

Date of Interview _____

Secondary Contact Recreation (SCR)

☐ Fishing ☐ Wading ☐ Boating ☐ Trapping ☐ Other:

If Interviewee heard of SCR use since Nov. 28, 1975, ask the following questions:

2.c.) When did these uses take place (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? _____

2.d.) Where, exactly? Describe specific location *and mark on the map* (See map requirements in the protocol). _____

2.e.) Which of these times and places (if any) did you hear specifically of children wading or playing? _____

V. Others to Contact?

Can you recommend someone else we could contact that knows the stream? ☐ Yes ☐ No

If yes, that person's contact info (name, address, phone, directions?) _____

If no, thank the individual for taking the time to talk to you and conclude the interview.

VI. Additional Comments

From the Interviewee: _____

From the Interviewer: _____

VII. Information on Interviewer

Has interviewer been trained by Missouri DNR to conduct UAA Interviews?

☐ Yes ☐ No

If yes, how? (check all that apply):

☐ Pre-Assessment Meeting ☐ Workshop ☐ On-line training seminar

☐ Other. If "Other," list: _____

Interviewer's Signature: _____

Interviewer's Name, Printed: _____

Employer (where applicable): _____

Interviewer's Phone No.: _____ E-mail: _____